MODEL LFOM PORTFOLIO

Case 1
Anaemia in restaurant worker

History:

A 33 year old Polish woman presented to me as her general practitioner with 3 month history of progressive dizziness, palpitations, weight loss and anxiety on exertion with excessive tiredness. She felt very stressed and emotional at the end of her working day.

She had a history of anaemia in the past (since the age of 2), and a normal pregnancy 22 months ago during which she was using iron and folic acid supplements.

She felt like the anaemia returned and wanted some time off work.

She had normal periods, no rectal bleeding and no family history of inflammatory bowel disease, colon cancer or haematological disorders.

She complains of insomnia due to her 1 year old son with atopic eczema and prutitis.

Her diet is poor. She is not vegetarian and not breast feeding and eats irregular meals outside of working hours.

Occupational health history:

She is working in a restaurant with adjacent deli for the last 5 years.

She works 7.5 hours, 6-7 days per week and may work 2-3 weeks ongoing without any days off.

She is one of 6 workers with typical job description of restaurant worker.

During busy times she will have no lunch or tea breaks.

She had no pre-employment medical exam and no occupation health service was available.

She was back at work for 9 months after pregnancy and was on sick leave since she was 12 weeks pregnant due to anaemia.

She did not have a good relationship with her employer without much communication.

Clinical examination:

She is slight built woman with BMI of 16.6.

Bp 99/84, pulse 81 beats/min, respiratory rate 28/min

No anaemia was found with all other systems within normal range.

No organomegaly or koilonychias was found.

Investigations and results:

Initial blood tests:

FBC: Hb 10.0 g/dl (12-15)

HCT = 31.4 L/L (36-46)

MCV= 77.0 fl (83-101)

MCH= 24.8 pg (27-32)

Platelets= 404 x 10^9/L (150-404)

WBC= 5.2 x10^9/L (4-10)

RBC= 4.04 x10^12/L (3.8-4.8)

Differential cell count normal

Vitamin B12 = 223 ng/l (150-800)

Folate = 1.3 ug/l (3.5-20)

Ferritin = 4 ug/l (5-204)

Thyroid, renal and liver functions normal

Ten days later she deteriorated with dizziness, lethargia, chest tightness and palpitations.

She was referred to the emergency department:

ECG – normal,

Chest x-ray – normal

FBC – HB dropped to 9.4 g/dl and MCV = 79 fl

Diagnosis and treatment:

She was diagnosed microcytic anaemia with deficiency of iron and folic acid, and started on treatment with Galfer FA (ferrous fumarate 305mg and folic acid 0.35mg) once daily.

She was referred for a gastroscopy and colonoscopy to rule out gastro intestinal bleeding and coeliac disease as cause of the anaemia.

Follow-up blood tests after 3 months: Hb=11.4g/dl, MCV= 76.4fl, MCH= 23.9pg (all still below normal)

5 Months later:

- Anti-tissue transglutaminase antibodies blood test was positive at 98.
- normal gastroscopy
- small bowel mucosa biopsies showed subtotal villous atrophy and inflammation in lamia propria confirming coeliac disease.

She was started on gluten free diet and referred to dietician but she did not attend the appointment.

Case management: (oh management and prevention)

After her initial diagnosis she was started on treatment for the anaemia.

She stated she was well enough to work with adjustments of work hours to 3-4 days per week and a letter was sent to her employer.

Ten days later she deteriorated and became unfit for work and started on sick leave.

There was no work policy on sick absence or illness benefits and she started on social welfare payments from government.

Return to work was discussed at follow up visits but she was not keen on returning to work and not willing for phased return to work.

She was scared of her manager and of losing her job and had poor communication with the employer. Allegedly employees were easily replaced when they could not cope with working conditions. She refused to give consent to contact her employer.

Her son was thriving with her at home and she was considering starting her own business.

She returned to work after 8 months of sick absence and 2 months after initiation of gluten free diet.

Follow up:

At 2 months she was feeling subjectively better but blood tests at 3 months did not confirm the response. (HB =11.4g/dl).

Follow up bloods after 2 months on gluten free diet showed a good response (HB= 13.3g/dl, MCV = 81.3fl, MCH =26.9pg).
She continued treatment for 6 months and her blood tests returned to normal at 6 and 12 months.

Clinical discussion:

According to WHO definition she has microcytic anaemia with iron and folate deficiency (2).

Incidence:

- Iron deficiency anaemia (IDA) has an incidence of 5-10% in menstruating British women (3).
- Folic acid deficiency incidence is as high as 20% in US (4).
- 8% of women can have below average haemoglobin levels according to WHO (5).

Cause of Anaemia: In this case the cause was malabsorption due to coeliac disease with poor diet as contributory factor (4).

Symptoms: She presented with symptoms of gradual onset and moderate anaemia with deterioration to severe symptoms (5).

Recommended investigations: to determine cause

- occult blood – was not done as no clinical indication
- anti endomysal antibodies and IgA – could be done earlier
- gastroscopy and small bowel biopsy (if symptomatic) followed by
- colonoscopy or barium enema(3) - not needed as diagnosis of coeliac disease was made and she responded to treatment.

Aim of treatment:

IDA:

1. Restore the haemoglobin and MCV - haemoglobin should increase with 2g/dl after 3-4 weeks (3).
2. Replenish the iron body stores – 3 months treatment.

Ferrous sulphate 200mg tds (Ferrous gluconate or –fumarate)- 80% of cases resolve in 6 months (3).

Folic acid:

1. Restoring the diet as folic acid is not stored in the body.(3) – symtoms improve after 5-7 days and full recovery at 1-2 months (4).

Galfer FA could be initiated as twice daily dose and ascorbic acid could be added to enhance absorption. (3)

This patient did not respond as expected after 3 months of treatment due to malabsorption with further nutrient loss.

Poor compliance and wrong diagnosis could also be considered.

The response was good to treatment after she started a gluten free diet.

Follow up: was done as recommended at 6 and 12 months and annual tests should be continued (3). She is to continue on gluten free diet.

Occupational management:

General duties of the Employer according to the *Safety, Health and welfare at work act 2005* requires every employer to ensure as far as reasonably practical, the safety, health and welfare at work of all his or her employees. (1)

If a **Pre-employment medical examination (PEM)** was done she may have been flagged as at risk for developing anaemia:

Employee's history:

- Work history - type of work and work absence.
- Pregnancy – iron and folic acid deficiency with work absence
- Medical history of anemia, sleep deprivation
- Previous episodes of fainting or syncope at work or at home

Examination: signs of anaemia, low BMI and poor general health.

Special investigations: FBC

She has a physical challenging job with long work hours (45-52.5 hours per week) and is entitled to regular breaks (6).

Factors that could indicate an underlying medical problem:

- Fainting, breathlessness or dizziness at work
- Tiredness, slow work speed or late morning arrival
- Lack of exercise tolerance
- Previous sick absence – lost days
- Absence of health and safety systems/policies.

Her symptoms of fatigue, breathlessness and impaired exercise tolerance were relevant to determine **fitness for work**. Her anaemia restricted her work capacity due to reduced oxygen transport and impaired muscle function (7,8). A risk assessment was needed to determine physical challenges of her work.

Work adjustments were considered initially (moderate anaemia) according to guidelines (9):

- Reduced/flexible hours
- Job rotation to reduce standing
- Reduce heavy physical work

As symptoms deteriorated (severe anaemia) she became unfit for work.

Factors that could influence the length of absence from work:

1. <u>Biological:</u>
    - Anaemia due to coeliac disease – chronic anaemia with slow onset is better tolerated than acute anaemia due to the body's ability to adapt for improved oxygen delivery to the tissues (10)
    - Age and health status –poor health status (low BMI and sleep deprivation)
    - No Alcohol or illicit substance use
    - Response to treatment (5) – she initially did not respond as expected (fatigue should improve over 8 weeks with increase of HB > 12 g/dl) (10). She only improved after gluten free diet started.
    - Long waiting times to diagnose cause of anaemia.
    - Possible recurrence during future pregnancies.

2. Psychological:
    - Beliefs of the patient about work: symptom free before return to work, job is aggravating or causing the symptoms (no breaks).
    - Organizational: support from manager is important to encourage a positive attitude (10).She refused to consent to contact employer.
    - Small child at home thriving with her at home
    - Consideration of own business
    - Financial gain with illness benefits
3. Social:
    - Stress at organizational level, poor communications
    - no health and safety officer at work
    - no employee assistance programs
    - no sick leave policy or sick payment scheme at work.

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Case 2

Post traumatic osteo arthritis in an office worker

- **History, including OH**

This active 31 year old woman is working in a human resource centre for the last 5 years.

Her company is doing recruitment for teachers, outreach centers and other college workers.

They are situated on the 2nd floor of a 3 story building connected only by stairs to the canteen and finance department on other floors.

She is actively involved in the administration of the recruitment process with duties of calling and managing the recruits, typing and filing reports as well as serving tea and cleaning. She has a physical job involving climbing, bending, kneeling, pushing and pulling of drawers weighing <10kg.

She injured her left knee during a local soccer match and was sent to A&E where she had a normal x-ray.

She consulted me as her GP 2 days later with severe pain and inability to bear weight on the knee.

The acute injury was managed with rest, NSAIDS, local gel and ice.

She did not improve significantly and was referred to orthopaedic surgeon for MRI.

- **Clinical examination**

She is slender woman with BMI of 23.

The left knee was swollen with an effusion, very tender medial aspect with initial difficult evaluation of the ligaments and menisci.

The swelling and effusion resolved but she remained very tender over the medial aspect of the knee with reduced range of movement and pain on stressing the medial meniscus. The ligaments were intact.

- **Investigation and results**

X-ray: normal.

MRI: Oblique tear of the posterior horn of the medial meniscus.

Arthroscopy: Grade II chondral changes of the lateral tibial articular surface, grade I to II changes on the patellar articular surface mainly lateral. Normal menisci and ACL.

- **Diagnosis and treatment**

Diagnosis: Post traumatic osteo arthritis (OA) of the left knee.

She used anti-inflammatory painkillers: Celebrex 100mg BD, Paracetamol 1g qds and Voltarol gel.

Epimorph injection was given during the arthroscopy and physio therapy commenced.

The consultant recommended regular steroid injections and knee replacement in long term.

Physio therapy consisted of: pain management, strengthening programme, Mc Connells taping, laser treatment and alternative exercise program of swimming and cycling.

She was very motivated and compliant with her exercises.

- **Case management -Emphasizing OH management and prevention**

She was unfit to work since the accident, and received government funded illness benefits.

The company's occupational health doctor assessed her after 6 months of absence and recommended work adjustment to an exclusive seated desk post. The company was unable to provide her with the suggested post and she was asked to stay off work until she made a complete recovery.

There were no work policies, disability or sick payment scheme available.

After 11 months of illness benefits she was assessed by The Department of Social Protection and was found to be capable of work, although she was unable to perform her normal job. She appealed this decision.

- **Follow up**

One year after the injury she was still unable to perform her work and did not make a full recovery. She still complained of pain in the knee with exertion and night pain. The knee was worse with driving and sitting for long periods.
She controlled the symptoms with medication, and participated in cycling and swimming at leisure.
Her company is moving their premises which will force her to commute, and make future employment more challenging.

She accepted that she will not make a full recovery but felt incapable to work. She wanted to retrain for alternative employment, but was scared of discrimination.
She felt frustrated towards her employer for a lack of communication. Her contract had not been terminated and she was seeking legal advice on this issue.

- **Discussion**

Post traumatic osteo arthritis implicates a time relationship of 15 years in young people and 5 years after the age of 30, between trauma and the development of osteo arthritis (OA) (1).
Prevalence: overall 12.8% and OA of the knee of 7.1%.
Higher prevalence of OA:

  - Women
  - Ageing
  - Less than 12 years education
  - Dose response with increase BMI

OA causes increased sick absence, fatigue, increase of health care visits and emotional distress and if diagnosed at a young age has a high risk of life long disability. (2)

Physical work activities can cause or aggravate knee OA.(3,5) This risk increases with cumulative years in the physical occupation (3) and female

employees performed lower with a lower self-reported health (4). Sitting jobs can be a protective factor (5).

Early treatment:

- Symptom control– non steroid anti inflammatories, ice and ultrasound with knee bracing for instability. (6)
- Strengthening exercises improves the symptoms of knee OA, and greater muscle strength and endurance was found to be a protective factor in women for further cartilage loss.(7) Training 1-3 times per week was found to be effective for pain management.(8)
- Arthroscopic washout, resection and debridement improve symptoms in 60% of cases for up to 5 years. (6) Ulcerated cartilage (common after trauma) once damaged cannot recover.
- Replacement of the articular surface with artificial prosthesis which has a limited life time of 10-15 years (9). This woman is too young for knee replacement due to the limited life of artificial joints.

The economic burden of OA is more costly than rheumatoid arthritis and increases with ageing and obesity (10).

Direct costs: pain relief and hospitalization and surgery in only 5% of cases.

Indirect costs: work related losses and cost of home care. (10)

She already has a burden of increased health costs and loss of earning and could lead to deterioration of quality of life and depression (11).

OH Management:

1. General duties of the Employer according to the *Safety, Health and welfare at work act 2005* requires every employer to ensure as far as reasonably practical, the safety, health and welfare at work of all his or her employees.
    I. The first stage of OH management after the acute sick absence should be the evaluation by an occupational health doctor.
    II. This should be followed by an appropriate risk workplace assessment by a qualified assessor or occupational health

practitioner, to make reasonable changes or adjustments to accommodate the employee.

2. According to the *Employment quality act of 1998 and 2004*, the employer must do all that is reasonable to accommodate the employee with a disability, unless the employer can show that there is a cost to him/her other than a nominal cost.
    - Work adjustments could include adaptations to the premises and equipment but more practical would be to adjust her tasks and hours.
    - She would not be able to do any kneeling, bending, squatting, heavy lifting and climbing of stairs, but redistribution of tasks between other employees may be reasonable.
    - She could be trained into another type of employment in the same company
    - Changing the premises could be unreasonably costly, although new premises could be better designed. Commuting long distance every day would not be advisable.

3. *Organizational changes:*
    - Communication between employer and employee.
    - The occupational health doctor could clarify the 'seated desk job' with the employer and she could be introduced to a phased return to work, although job retention with OA was lower in small businesses and was not found to be better with job modification and access to OH advice. (12)
    - Work policies - workplaces with better work policies (work accommodations and benefits of sick payment and disability payment) had less knee symptoms and lower prevalence of knee OA. (10)
    - Work disability scheme – she is at risk of losing her job due to ongoing disability and the company may face legal action.

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Case 3

Inguinal hernia in engineering worker

- **History, including OH**

This 54 year old Russian man presented to me as his GP with a painful lump in the left inguinal area. He gave a history of mild pain for the last 5 years with a gradually developing mass in the left inguinal area. The pain was worse with lifting and coughing and better at rest in the evenings.

He has osteo arthritis of the hands and presented a few times at the GP practice with mechanical lower back pain that resolved with conservative treatment.

He has no family history of inguinal hernias or arthritis.

He relocated from Russia 9 years ago and works in an engineering works since.

He is a hard worker in a physical demanding job. He is one of 4 welders who works independently, without any assistance and has to lift and handle steel pipes daily for the manufacturing of agricultural gates.

There is no job rotation or shift work, and works a 40hour work week.

- **Clinical examination**

He is man of average build with BMI of 27.

He had a large mass in the left iliac fossa which was fully reducible and worse with increased abdominal pressure. No strangulation or incarceration was present, with normal bowel sounds. His scrotum and genitals were normal. He was not constipated and did not suffer from any haemorrhoids.

All his other systems were within normal limits.

- **Investigation and results**

No special investigations were done, and he was referred to a local surgeon for further treatment.

- **Diagnosis and treatment**

This is a typical case of an inguinal hernia, and the surgeon confirmed this 7 weeks later as a direct inguinal hernia on the left side.

He was booked for elective surgery in 5 weeks.

The surgeon performed an open traditional herniorrhaphy, the content of the hernia was returned to intra-abdominal position and the defect was repaired using a synthetic mesh.

His post operative period was uncomplicated.

- **Case management -Emphasising OH management and prevention**

After the diagnosis was made he returned to work with adjustments until the surgery:

- 3-4 hours per day
- 3 days per week
- No lifting, pushing or pulling anything heavier than 10kg.

He was on sick absence after the surgery for 8 weeks with government provided illness benefits.

He returned to work with work adjustments for 2 weeks:

- no lifting, pushing or pulling of object heavier than 10kg, no overhead lifting
- full working hours of 8 hours, 5 days per week

The company temporarily moved him to a different area where welding is done for structural steel beams with assistance of a crane.

- **Follow up**

After 2 weeks of modified duties he returned. He had ongoing pain in the left groin on ambulation. The wound healed well with scar tissue formation and paresthesia inferior to the incision site.

His modified duties were extended for 2 weeks after which he made a full recovery and returned to his normal duties.

- **Discussion**

Hernias are 8 times more common in men than in women and in whites compared with non-whites. (1,2)

Approximate 96% of groin hernias are inguinal, and 30-40% of these are direct inguinal hernia. (1)

Etiology:

Hernias can be due to congenital or acquired weakening of the abdominal wall allowing the intra abdominal contents to protrude through the defect.

They can be classed as direct or indirect according to the anatomical location (1)

The relationship between inguinal hernias and intermittent strenuous exercise or heavy lifting is not clear. Some studies came to the conclusion that the rate is higher in occupations that involve manual labour (1,3,4), and some came to an opposite conclusion (5).

Work related hernias could be a preventable injury and leads to a loss of productivity and lost workdays. (6)

One study found that some indirect hernias can be attributed to a single strenuous event (3) that could occur in the occupational environment.

It can be concluded that a susceptible individual involved in manual labour is at higher risk of developing a hernia.

Treatment:

Emergency to elective surgery; open techniques and keyhole surgery with various types of mesh used are all effective.

Patients can return to work 3-15 days after laparoscopic surgery and full manual labour at 14 days. (7,8)

After open surgery the patient can return after 6 weeks. (4)

Successful hernia repair is achieved by reducing factors that increase intra-abdominal pressure.

Recurrence of the hernia can be as high as one in five, and 27.8 % can suffer from persistent pain with negative effect on quality of life (4,9)

OH management:

General duties of the Employer according to the Safety, Health and welfare at work act 2005 requires every employer to ensure as far as reasonably practical, the safety, health and welfare at work of all his or her employees. (10) Emphasis is here on the following duties of care:

- ω Management and conduct of work activities
- ω Design, provision and maintenance of (i) safe workplaces, (ii) safe means of access and egress form the workplace and (iii) safe plant and machinery.
- ω Providing safe systems of work
- ω Provide adequate instruction, training and supervision Prepare risk assessments and safety.
- ω Obtain where necessary the services of a competent person to assist in ensuring the safety, health and welfare of his or her employees.

General OH measures in prevention of hernias include:

At Pre employment level:

Factors to consider in an employee's history that could indicate an increased risk of developing a hernia: - Family history of hernia

- previous hernia repair
- connective tissue disorders
- smoking (reduced integrity of connective tissues and chronic cough)
- aorta aneurism (connective tissue abnormality)
- abdominal wall injury/previous abdominal surgery
- older age, male sex, Caucasian race
- signs of increased abdominal pressure (hemorrhoids) varicose veins (4)
- chronic glucorticosteriod use

Employees with positive risk factors are not unfit to work but the risk should be documented and explained to the employees, and encourage to have regular medical checkups.

Examination:

BMI – obesity has lower prevalence of hernias. (1)

Emphasis of examination of the groin and inguinal canal is needed for any heavy manual worker.

Asymptomatic hernias should be treated as the mortality is higher with emergency surgery compared to elective (2). These workers should not do heavy manual labour.

Work related measures:

- Risk assessment and reducing the risk of heavy lifting, pushing and pulling, with regular review of hazards especially after sick absence and incidents.
- Employee education on risks and manual handling techniques by competent person.
- Regular reviews of sick absence notes of heavy manual workers for muscular strain injuries that can yield towards higher risk for developing hernias.
- Review of weight lifted and the number of years in the job. Higher risk of hernias are found with increased weight lifted as well as the amount of years in this activity.(11)

Rehabilitation post surgery with goal of preventing recurrence of hernia:

Review of the risk assessment to assess risks and hazards to include:

- Reduce lifting, pushing and pulling of objects above 10kg, and any other action that can increase intra abdominal pressure for 6-8 weeks to reduce chance of recurrence (4).
- Provide assistance or mechanical support to reduce manual weight lifted, within reasonable practicable.
- Possible rotation of work to lower risk areas
- Reduced hours where rotation is not possible
- Regular review by health and safety officer at work for persistent pain and recurrence of hernia(if available)
- Regular medical review with OH doctor or GP
- Work policies in place – illness benefit for employees
    - ω policy on medication that can sedate (pain medication)
    - ω employee education and support on smoking cessation and other health promotion

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Case 4

General anxiety disorder due to workplace bullying

History, including OH

A 33 year old woman presented to me as her GP with general symptoms of anxiety, headaches, dizziness, nausea and insomnia.
She complained of stress at work and says she was unable to function at work. She had slight depression without suicidal thoughts and lost weight.
She had no history of previous mental health disease, denied use of drugs and alcohol and no family history of the same.

She and her partner of 18 years relocated from Latvia 4 years ago and she was working in a chain department store since. They have no children and were adjusting well to new environment.
She was a hard worker and worked in chemical engineering company before. Her duties were with customers and she enjoyed her work. She worked 55 hours per week.

Two years after the first consultation she confessed daily workplace bullying for 18 months. She was allegedly verbally abused by her manager with one episode of minor physical assault (pushing).
She never regarded this as a cause of her anxiety and did not report it to management as she said she had no witnesses. She previously had a good relationship with her manager.

Clinical examination

She appeared anxious, shivering, was very skinny with BMI of 21.
Bp 120/93 heart rate 106 – tachycardia
General examination was normal.

Investigation and results

Full blood count, thyroid-, liver-, renal functions, glucose, vitamin B12, folate and iron were all normal.

Diagnosis and treatment

According to DSM-IV TR and ICD -10 criteria she was diagnosed with general anxiety disorder.

Bullied victims can suffer from PTSD-like symptoms, although they do not necessarily match the strict DSM-IV criteria (absence of A1 criterion). (1)

She was started on Alprazolam 250mg and Omeprazole 30mg, with Duloxetine 30mg added after 1 week. Her insomnia was resistant to Dalmapam 30mg, Zolpidem 10mg, and she could not tolerate Pregabalin 25mg, Mirtazapine 15mg and Chlorpromazine 25mg.

After one month she was changed to Ecitalopram and the dose was titrated to maximum dose of 20mg daily. She responded after 4 weeks.

She refused counselling, CBT treatment and psychiatric referral.

Her mood improved significantly after a holiday to Latvia.

Case management- Emphasising OH management and prevention

She was started on sick certificates with diagnosis of stress stated, with government funded illness benefits. She was absent from work for 8 months.

She was never seen by the occupational health doctor during her absence although management was supportive. No employee assistance programs were available.

She returned to work with adjustment to her work hours:

- Reduced to 4 days per week, 8 hours a day.

She did not tolerate this adjustment and her hours were reduced to 2 days per week, 8 hours a day.

She is still on these work adjustments and her symptoms returns with any increase in hours or stress.

Management was unaware of the bullying and did not assess her stress as noted on the sick certificates. Other employees were also allegedly affected.

Follow up

She was seen weekly for the first 2 months and monthly thereafter. After she started to respond to treatment the visits reduced to 3 monthly and 6 monthly.

She had a significant improvement 2 months after she started working, and this coincided with the manager leaving the company.

Discussion

General anxiety disorder has a lifetime incidence of 5%, with onset before the age of 25 and women twice as likely to be affected as men. (2)

A UK-based surveillance scheme suggests that work related mental ill-health is increasing by around 13% per year.(3).

Risk factors:

1. Family history of anxiety disorders.
2. History of physical or emotional trauma.
3. Increase in stress – including work stress.
    - job demands, (4)
    - extrinsic effort (4)
    - over-commitment.(4)
    - Effort-reward imbalance (5)
    - Working hours – close to threshold values per workweek (6)
    - Workload (7)
    - Reward and skill discretion was protective.(4)
    - Extensive organizational changes and the anticipation thereof. (8)
    - Workplace bullying is a predictor of mental distress. (9)
4. Family support, social support was found to be protective.

The only risk factor that was present in this case was work related stress and alleged bullying.

GPs reported that they would treat the stress-at-work patient with:

- anxiolytics (66.5%),
- sick leave (65.7%),
- referral to an occupational physician (80.3%)
- mental health specialist (44.8%) (10)

Treatment consists of:

- Pharmacotherapy - SSRI's, SNRI, anxiolytics (benzodiazepine), Pregabalin, sedatives and others like tricyclic antidepressants, sympatholytics, beta blockers
- Psychotherapy: Cognitive behavior therapy

She was only treated with pharmacotherapy because she refused psychotherapy (CBT).

She did not respond to treatment as expected due to the following reasons:

- Ineffective treatment – several changes to treatment
- Under treatment – titration of dose was needed
- Ongoing stress at work

OH management:

1. General duties of the Employer according to the *Safety, Health and welfare at work act 2005* requires every employer to ensure as far as reasonably practical, the safety, health and welfare at work of all his or her employees. Prevention of bullying is a management responsibility (11).
2. Employees have rights to not to be bullied and duties (report problems and bullying) regarding safety, health and welfare at work under the *2005 Act (11).*

Opportunities exist for employees who are bullied in the work place to take civil action against employers for failing to provide them with a safe work environment (11,12)

3. The *Employment Equality Acts 1998 and 2004* outlaw discrimination any of the following nine grounds:
    - Gender
    - Marital status
    - Family status,
    - Sexual orientation
    - Age (>16)
    - Disability
    - Race, nationality

- Religion
- Membership of Traveller community.

4. The 'Code of Practice for employers and employees on the Prevention and Resolution of bullying at work' under the Safety, Health and Welfare at Work Act 2005, is aimed at preventing and dealing with bullying (11).

Incidence:

- One in 13 women reported bullying on survey conducted in 2001 (11)
- 38% in NHS UK survey, 47% in Turkish study (13), 42% witnessed bullying in the workplace (14)
- The length of bullying on average was three years (15)

Bullies can involve people at all levels but is more likely to be managers with poor communication and organizational skills and low self-esteem (13).

Bullying is at cost for both employers and employees.

High suspicion for factors that can signal a risk of bullying:

- High turnover of staff, high absenteeism or poor morale
- New, casual or contract workers may be easy targets.
- Hierarchies.
- Changes in the workplace –. Even the anticipation of change in the workplace can increase work stress (8).
- Relationships in the workplace – no effective management
- Personality
- Gender/age imbalance
- Other factors: composition of the workforce, interface with the public, history of tolerance of unaccepted behavior, lack of adequate procedures dealing with bullying.

Prevention in the workplace:

- Good job design, training and supervision can help overcome difficulties for future bullies.
- Workplace policy on bullying with training and education of all employees

- Risk assessment to decide if bullying is a hazard and what the risk to different employees are – and included in Safety statement.
- High index of suspicion on long term absence due to stress with referral to occupational doctor.
- Ensuring clarity of individual and department goals, roles and accountabilities; job demands and job resources
- Access to relevant competent and supportive structures, internal and external. (13)
- Provision of employee assistance programs (EAP) to ensure early return to work.

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Case 5
Stenosing flexor tenosynovitis (trigger finger) in a meat-processing plant

- **History, including OH**

  This 37 year old man is working in a meat processing plant for the last 11 years.

  He is trained to do several specific tasks and rotates every 2-3 months depending on available staff. He started a new rotation in the previous 3 weeks when he presented to me as his GP.

  He had pain and stiffness in right thumb with catching of the interphalangeal joint (IPJ) which was worse after work and caused trouble working. The symptoms were progressing and he was unable to grab with the right hand.

  His job was to grab the internal chest organs with the right hand (manual dexterity) and pull them out of the carcass – no tools used.

  He stated that the plant was working under pressure and handled between 300 and 400 carcasses per hour. During less demanding times they would only handle 250-300.

  He was seen previously with musculoskeletal injuries of the lower back and shoulders.

- **Clinical examination**

  He was of average built with no systemic diseases.

  He had pain in right interphalangeal joint (IPJ) of thumb with reduced movement and clicking

  and catching on movement. The thumb had reduced opposition and some laxity of the IPJ ligament, and was neurovascular intact.

- **Investigation and results**

  No special investigations were done, this was a clinical diagnosis.

- **Diagnosis and treatment**

  A diagnosis of trigger thumb (stenosing flexor tenosynovitis) was made.

He was treated with NSAIDS and sick certificates for 3 weeks with diagnosis of work related thumb injury. He received government funded illness benefits.

- **Follow up**

  After 3 weeks he attended the Emergency department with the same complaints.

  He saw an orthopedic surgeon, had normal x-rays and was given a brace for 6-8 weeks with ongoing work absence.

  Six weeks later he still had pain on flexion of thumb and a GP colleague performed acupuncture on the tendon and joint area.

  The dorsum of the right thumb and ICJ was infiltrated with 0.5ml Depomedrone (Methylprednisolone) one week later due to ongoing symptoms.

  He started physio therapy of the thumb and returned to work 4 weeks later.

- **Case management- Emphasising OH management and prevention**

  He was absent from work for 4.5 months with government funded illness benefits

  He returned to work with adjustments:

  - rotated to different work area where he used both hands
  - Job demanded 2 persons in same position

  The plant was on lower capacity due to reduction in demand.

  Job rotation of 2-3 months was still in place.

- **Discussion**

  Trigger finger is a common finger ailment, caused by inflammation and subsequent narrowing of the A1 pulley (over MP joint).

  <u>Incidence</u>

  - The lifetime risk is between 2 and 3%, increases to up to 10% in diabetics (1).
  - 6 times more common in women, typically in the fifth to sixth decade of life (1).

- The ring finger is most commonly affected, followed by the thumb (trigger thumb) (1).
- The vast majority of trigger fingers develop for reasons other than occupational (2).
- Point prevalence in a Canadian meat processing plant was 14%., and was almost 6 times more common in hand tool users than non-tool users. (3)

This case is a typical presentation of trigger thumb and only had occupational risk factors:

- Occupational risk factors:
  - repetition,
  - high force (3),
  - awkward joint posture,
  - direct pressure,
  - vibration (5)
  - heavy lifting and/or high force gripping (4,5)
  - tool use (3)
  - Certain occupations: secretary, seamstress, homemaker (7)
- Diabetes (1)
- local trauma (1)
- more common in dominant hand (1)
- carpal tunnel syndrome, de Quervain's disease
- hypothyroidism
- rheumatoid arthritis
- renal disease
- amyloidosis
- obesity (7)
- possible fluoroquinolone treatment (8)

Treatment

Initial management of trigger finger is **conservative** and involves activity modification with identification and adjustment of occupational risk factors (biomechanical and ergonomical) (6).

Splinting – 81% effective and appropriate alternative treatment for patients who refuse or wants to avoid steroid injections and can immediately return to work (9). It's more effective for symptoms of locking and less successful for severe triggering or longstanding symptoms.

Steroid injections – has 93% success especially in non- diabetics, recent onset of symptoms and on affected digit (10). The effects can last up to 12 months and a second injection is only half as likely to succeed. Studies found that 2 steroid injections before surgery was the least costly treatment strategy (11).

Physio therapy has a role in the prevention of recurrence (12).

Open surgery is indicated for failure of conservative treatment and cases of long duration. The cure rate is 90% and is a low risk procedure with low recurrence (1).

❖ **OH management:**

General duties of the Employer according to the Safety, Health and welfare at work act 2005 requires every employer to ensure as far as reasonably practical, the safety, health and welfare at work of all his or her employees. (13)

Prevention at pre-employment level:

Employees with many risk factors in their history should not be exposed to high risk jobs.

Certain occupations such as secretary, seamstress, meat processing industry and homemaker carry high risk.

Work related prevention:

- Risk assessment and reducing the risk of repetitive movements, high force gripping, and vibration with regular review of hazards especially after sick absence and incidents.

- Employee education on risks and training in manual handling techniques by competent person.
- High risk jobs needs regular review by health and safety officer or supervisor, and review after sick absence for muscular.
- Regular review of techniques used and possible new engineering controls to reduce risk.

Post intervention rehabilitation – with goal of preventing recurrence:

Review of the risk assessment:

- Avoid same repetitive action that initially caused the injury for at least 8 weeks post-surgery or intervention.
- Reduce risk factors: frequent rotation of jobs, reduced hours in repetitive job (daily rotation) and mechanization of job if practicable.
- Regular review by health and safety officer for repeated symptoms
- Medical review on regular basis by OH doctor or GP
- Work policies:
  - ✓ illness benefit for employees
  - ✓ policy on medication that can sedate (pain medication)
  - ✓ employee education and support on health promotion

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Case 5: Workplace assessment of heat hazards and heat stress in an alumina refinery.

I led this assessment to advise on managing the risks of heat stress at an alumina refinery. There was already a heat management program in place; it was re-evaluated due to the climate crisis, an aging and more comorbid workforce, and regulatory focus. I aimed to re-evaluate potential heat stress hazards and optimise control measures.

Description of Site

The facility was an alumina refinery in Australia, [redacted]. I noted a complex chemical process to extract alumina from bauxite:

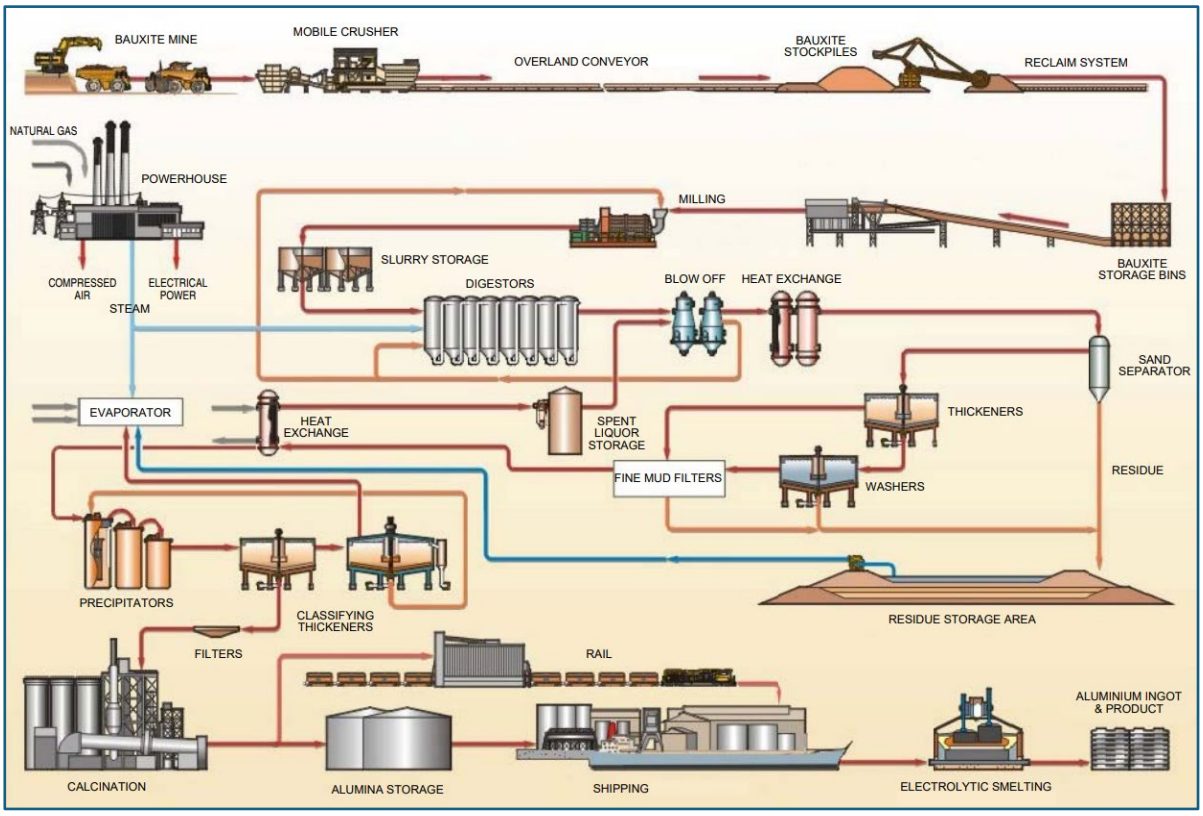

Figure 1: Process flow diagram for bauxite mining and alumina refining[1].

1. **Digestion***:* Bauxite is mixed with a hot caustic soda solution, generating heat.
2. **Clarification***:* Solid impurities are separated from the alumina solution.
3. **Precipitation***:* The alumina solution is cooled to precipitate alumina hydrate.
4. **Calcination***:* Alumina hydrate is heated in large kilns to remove water, producing alumina powder. This stage is a significant source of radiant heat.

I noted workers in a variety of roles, including process operators, maintenance personnel, and support staff. Work environments vary significantly.

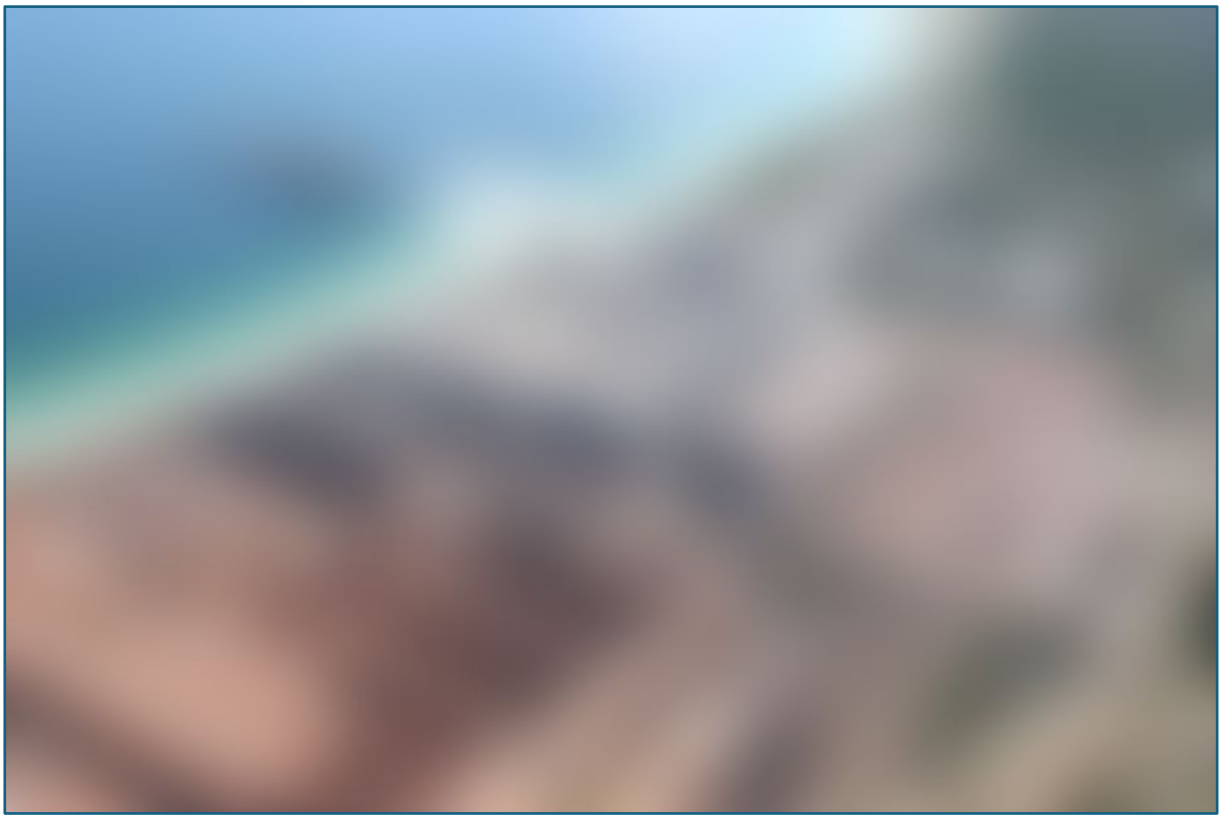

Figure 2: Aerial photography of the site, illustrating scale and diversity of environments/processes.

Local Climate: Hot, dry summers with average daily temperatures often >30°C. Humidity generally low. Winters typically mild and wet.

Climate Data: I obtained local climate data from the Australian Bureau of Meteorology (BOM)[2]. Historical temperature and humidity records, seasonal climate outlooks, and specific site forecasts were reviewed to understand the typical and extreme weather conditions relevant to the site.

Perceived Hazards

The primary hazards I observed contributing to heat stress at the alumina refinery were:

1. **Ambient Air Temperature:** especially during summer months.
2. **Radiant Heat:** sunlight, hot surfaces, heat-generating chemical processes.
3. **Conductive Heat:** contact with hot surfaces (pipes).
4. **Endogenous Heat:** physical exertion during work tasks.

5. **Personal Protective Equipment (PPE):** there was a site-wide mandate of long-sleeve shirt and trousers, safety boots, and helmet. In certain tasks, additional PPE was required, adding to heat risk (see *Figure 9*).
6. **Work in Confined Spaces:** Poor ventilation and potential for rapid heat build-up, especially during welding tasks.
7. **Lack of Acclimatisation:** New workers or recently absent workers are more susceptible. In an audit of coronial records of deaths at work in Australia due to heat stress, 54% of all deaths concerned a worker with less than one week's experience in the job[3].
8. **Individual Factors:** Pre-existing medical conditions, hydration levels, and substance use can influence susceptibility.

Figure 3: PPE requirements at the site. Certain high-risk chemical tasks required wearing a chemical gown, further adding to heat stress risk.

Risk Assessment

I conducted a risk assessment, considering the likelihood and consequence of heat-related illnesses:

Hazard	Population at-risk	Likelihood	Consequence	Risk Level
Temperature	Outdoor work (summer), indoor processing	Likely	Moderate	Medium
Radiant Heat	All non-office work	Likely	Severe	High
Metabolic Heat	Strenuous tasks	Likely	Moderate	Medium
PPE	All workers, some areas/tasks have added risk	Likely	Moderate	Medium
Confined Space Work	Vessel work	Possible	Severe	High
Lack of Acclimatisation	New/returning workers	Possible	Mild	Low
Contact with Hot Surfaces	Maintenance of equipment	Unlikely	Moderate	Medium

Consequence Levels:

Mild: Discomfort, fatigue, headache, mild dehydration.

Moderate: Muscle cramps, mild heat exhaustion, sun/contact burn.

Severe: Heat exhaustion requiring medical intervention, heatstroke.

Observations & Investigation Results

- **Environmental Monitoring:** Wet Bulb Globe Temperature (WBGT) measurements were taken in various areas during a hot day with the assistance of an industrial hygienist:
    - Outdoor work areas (direct sun): **WBGT 30°C (very high)**.
    - Processing areas (process heat): **WBGT 28°C (high)**.
    - Control rooms (climate-controlled): **WBGT 21°C (moderate)**.
- **Workload:** My observation of tasks revealed periods of high physical exertion, particularly during urgent repairs/maintenance.
- **PPE:** My observations suggested limited/inconvenient access to cooling aids (e.g., cooling vests). There were prolonged periods of work with multiple layers of PPE (e.g. chemical gowns, see *Figure 9*).

- **Hydration:** Water coolers were available, but not always conveniently located or maintained.
- **Work-Rest Cycles:** Scheduled breaks and work-rest cycles were mandated, but I noted supervisors demonstrated limited understanding of their rationale or application. It was also apparent they were ignored when there was pressure to meet production targets.
- **Interviews:** Feedback from workers indicated some experienced symptoms of heat stress during hot weather. Others were unsure about the procedures for reporting heat stress symptoms.
- **Injury/Illness Data:** I reviewed the company's incident/injury data which demonstrated significant numbers of presentations to onsite medical facilities with symptoms compatible with heat illness. The presentations were not always recognised or classified as potentially due to heat.

Significance of Observations

The observations highlighted several key areas of concern to me:

- **WBGT:** The WBGT readings in outdoor and processing areas indicated a high risk of heat stress.
- **Workload:** Physical exertion creates endogenous heat and can dehydrate workers by sweating, making them more vulnerable.
- **PPE:** Layers of PPE contribute to heat retention.
- **Hydration and Rest:** Inconvenient access to water and suitable rest areas can hamper preventative measures.
- **Underreporting:** Uncertainty about reporting procedures may lead to underreporting of symptoms, delaying intervention, and hides the scale of the problem. First responder's unfamiliarity with heat illnesses and their management was potentially driving under-recognition of the problem, and suboptimal treatment.

Legislation

In Australia, the relevant legislative framework is the Work Health and Safety (WHS) Act 2011[4].

Relevant aspects include:

- Employers have a general duty of care to ensure the health and safety of their workers, which includes managing the risks of heat stress.
- Safe Work Australia provides guidance material on managing the risks of working in heat[5].
- Employers have a duty to consult with workers on matters that may affect their health and safety.

Risk Reduction

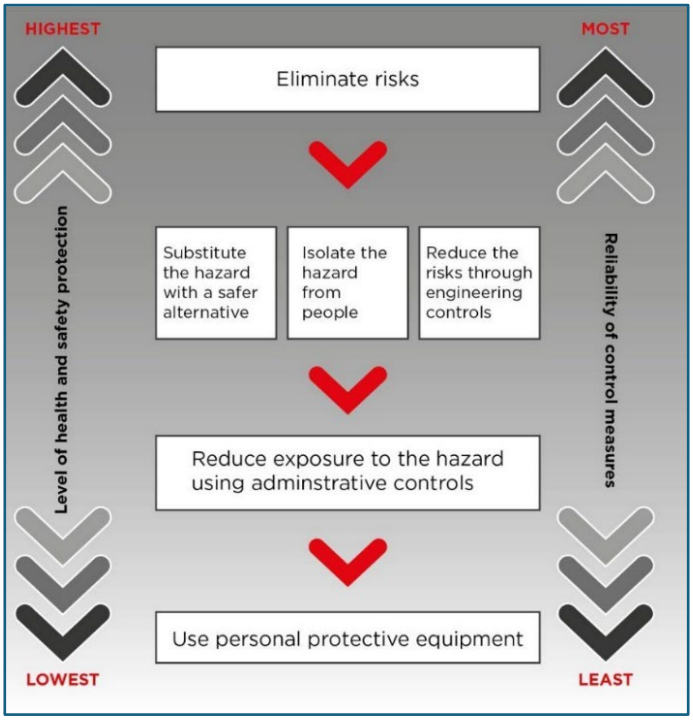

Figure 4: Hierarchy of controls[6].

I recommended a risk reduction plan, according to the hierarchy of controls:

Elimination:

- **Heat Sources:** Eliminate heat sources or processes that generate excessive heat. I acknowledged this was likely to be impractical for most core refinery processes.
- **Scheduling:** Schedule routine high heat-generating tasks for cooler times of the day or year.

Substitution:

- **Automation:** Utilise remote operation or automation for tasks in high-heat areas. The capital outlay for this was prohibitive in the context.

Engineering Controls:

- **Ventilation:** Improve exhaust ventilation in production areas to remove hot air.
- **Air Conditioning:** Install/maintain air conditioning in control rooms, rest areas, and potentially in some production areas where technically and financially feasible.
- **Heat Shielding:** Install barriers to reduce radiant heat exposure from the sun and hot equipment.
- **Insulation:** Insulate hot pipes to reduce conductive and radiant heat. May have added benefit of conserving process heat.
- **Misters:** Implement cooling water misting systems in outdoor work areas or designated cooling zones.

Heat Stress Category (WBGT)	Moderate Work		Hard Work	
	Work/Rest Cycle	Water Intake Per Hour	Work/Rest Cycle	Water Intake Per Hour
White ≤76.9°F (≤24.9°C)	60/15 MINUTES	300 ml (1/3 qt)	40/20 MINUTES	500 ml (1/2 qt)
Green 77-81.9°F (25-27.7°C)	60/15 MINUTES	750 ml (3/4 qt)	40/20 MINUTES	1000 ml (1 qt)
Yellow 82-84.9°F (27.8-29.4°C)	40/20 MINUTES	1000 ml (1 qt)	30/30 MINUTES	1000 ml (1 qt)
Red 85-88.9°F (29.5-31.6°C)	30/30 MINUTES	1000 ml (1 qt)	**Exercise is forbidden. Very high risk for heat casualties.**	
Black ≥89°F (≥31.7°C)	**Exercise is forbidden. Very high risk for heat casualties.**			

Figure 5: Example sliding-scale work/rest cycle and hydration guidance based on WBGT[7].

Administrative Controls:

- **Work-Rest Schedules:** Mandatory work-rest cycles, with frequent breaks in cooler, shaded areas, on a sliding scale depending on daily WBGT, task physicality, and layers of PPE (*see Figure 11*).
- **Fluid Replacement:** Easy access to cool water. Encourage hydration. Provide education to workers on pre-emptive hydration and analysis of urine colour. Provide electrolyte replacement drinks.
- **Acclimatisation:** Implement an acclimatisation process for new workers and those returning from prolonged absence.
- **Training:** Provide a training program to workers on recognising heat stress, prevention, first aid, and reporting. Include training in the existing worksite orientation training package for new workers.
- **Health Monitoring:** Include a questionnaire for the worker and guidelines for the examiner at pre-employment and periodic medicals to identify pre-existing conditions that may increase susceptibility to heat.
- **Supervisory:** Train supervisors to recognise heat stress symptoms in workers and enforce heat management procedures.

- **Physiological Monitoring:** A major outcome of this project was the introduction of physiological monitoring that measures core body temperature via a wearable smartphone-connected device that sends real-time alerts to workers and supervisors to detect heat stress early and prevent heat-related illness.
- **Treatment Protocol:** I developed a clinical flowchart and education program for clinical first-responders on detecting and managing heat illness (*see Figure 13*). The flowchart was adapted for use across the company's facilities in nine countries.

Personal Protective Equipment (PPE):

- **Cooling Vests:** Improve the use of cooling vests, scarves, and other garments (*see Figure 12*), particularly for work in high-radiant heat areas or when wearing heavy PPE.

Figure 6: A selection of heat stress PPE options[8].

Figure 7: Flowchart for heat stress assessment and management (own work).

Presentation of Findings

The findings and risk reduction strategies were presented to stakeholders through various methods:

- **Executive Consultation:** Management were presented with the findings and recommendations for approval.
- **Toolbox Talks:** Brief, informative sessions with workers and supervisors to discuss heat stress hazards, symptoms, and prevention strategies.
- **Posters and Signage:** Information on heat stress, hydration, and reporting procedures in prominent locations. The 'Heat Illness Management Protocol' was affixed to the wall of treatment/resus areas of the company's medical facilities internationally.
- **Policies:** The company's intranet policy on heat stress was substantially re-written.
- **Annual Review:** An annual cadence was set to review statistics on heat-related injuries/illnesses, climate trends, new technologies, and the effectiveness of the program at the end of each summer.

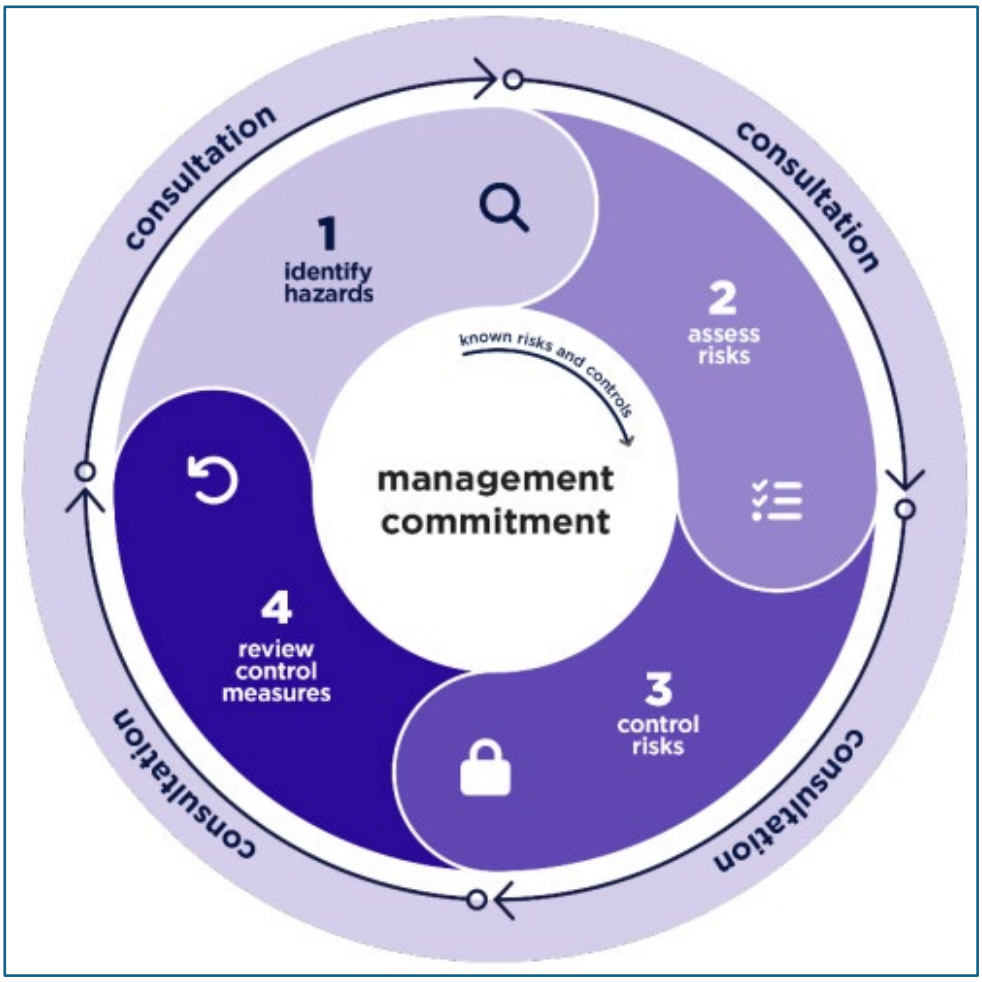

Figure 8: The risk management process[9].

Word count = 1498 (excluding text within figures)

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